IN THE SPECIFICATION:

Please replace paragraphs 3 and 4 at page 6 continuing onto page 7, with the following rewritten paragraph:

In the present invention, in order to solve the above problems, a communication system is configured with a first communication device for electrifying an ~~identification~~ electrification target having electrification properties by generating a quasi-electrostatic field modulated according to information to be sent; and a second communication device for detecting change in the electrification condition of the ~~identification~~ electrification target and demodulating the information based on the change.

In this case, in the communication system, it is possible to cause an [~~identification~~] electrification target to act as an antenna in a quasi-electrostatic field, isotropically from the surface of the ~~identification~~ electrification target, by electrifying the ~~identification~~ electrification target according to particular information. Therefore, it is possible to perform communication without the communication direction being restricted by the position of the electrode of the first communication device and without the communication strength depending on the electrode area, and thereby the degree of freedom in communication can be enhanced.

Please replace paragraphs 1 and 3 at page 7 continuing onto page 8, with the following rewritten paragraph:

In the present invention, even when the ~~identification~~ electrification target is a human body, it is possible to cause the human body to act as an antenna in a quasi-electrostatic field, isotropically from the surface of the human body, irrespective of the presence or absence of

movement of the human body because the human body is well electrified due to the nature thereof.

As described above, according to the present invention, an ~~identification~~ electrification target having electrification properties is electrified by generating a quasi-electrostatic field modulated according to information to be sent, and information is demodulated based on change in the electrification condition of the ~~identification~~ electrification target, so that it is possible to cause the ~~identification~~ electrification target to act as an antenna in a quasi-electrostatic field, isotropically from the surface of the ~~identification~~ electrification target, by electrification of the ~~identification~~ electrification target according to particular information. Therefore, it is possible to perform communication without the communication direction being restricted by the position of the sending-side electrode and without the communication strength depending on the electrode area, and thereby the degree of freedom in communication can be enhanced.

Please replace paragraph 1 at page 8, with the following rewritten paragraph:

Furthermore, according to the present invention, even when the ~~identification~~ electrification target is a human body, it is possible to cause the human body to act as an antenna in a quasi-electrostatic field, isotropically from the surface of the human body, irrespective of the presence or absence of movement of the human body because the human body is well electrified due to the nature thereof. Thus, the degree of freedom in communication can be enhanced.

Please replace paragraph 8 at page 11 continuing onto page 12, with the following rewritten paragraph:

Generally, when current flows through an electric dipole (dipole antenna), the electric field E generated according to the distance r from the antenna can be represented in a simplified formula as shown below:

$$E_0 = A\left(\frac{1}{r^3} + \frac{jk}{r^2} + \frac{k^2}{r^1}\right) \qquad .....(1)$$

where ~~A and j are constants~~ A is a constant, j is the imaginary unit, and k is the number of waves.

Please replace paragraph 4 at page 50 continuing onto page 51, with the following rewritten paragraph:

As apparent from Figure 25, if the distance between electrodes of the receiving electrode portion 106 is denoted by d_R [m] and the potential between electrodes of the receiving electrode portion 106 is denoted by V_R [V], the distance between electrode d_R and the potential between electrodes V_R are in the relation represented by $V_R(d_R) = 0.00088d_R - 0.00034$. Since the potential between electrodes V_R is less affected by the constant term 0.00034 but is greatly affected by change of the distance between electrode d_R, the constant term can be omitted. As a result, the distance between electrode d_R and the potential between electrodes V_R [~~are~~] can be in the relation represented by the following equation.

$\cancel{V_R(d_R) = 0.0005\square d_R}$ ~~.....(15)~~

$V_R(d_R) = 0.00088d_R$ .....(15)

Please replace paragraphs 2 and 4 at page 51, with the following rewritten paragraphs:

As apparent from Figure 26, the relation between the potential between electrodes of the receiving electrode portion 106 ~~is in proportion to~~ and the electrode area of the sending electrode portion 105 is approximately a proportional relation.

As apparent from Figure 27, the relation between the potential between electrodes of the receiving electrode portion 106 ~~is in proportion to~~ and the distance between electrodes of the sending electrode portion 105 is approximately a proportional relation.

Please replace paragraph 3 at page 53 continuing onto page 54, with the following rewritten paragraph:

For example, in the case where, as the various conditions for the simulation in Figures 24 to 27, the electrode area A_S of the sending electrode portion 105 is assumed to be 8×4 [cm^2], the distance between electrodes d_S of the sending electrode portion 105 is assumed to be 2 [cm], the distance between electrodes d_R of the receiving electrode portion 106 is assumed to be 2 [cm], the potential V_S (f) to be applied to the sending electrode portion 105 is assumed to be 1 [V] with a single frequency, the sending electrode portion 105 is assumed to be positioned at a hip pocket, and the receiving electrode portion 106 is assumed to be positioned at the head top of a human body, the potential between electrodes V_R (f) generated at the receiving electrode portion 106 is ~~0.0005~~ 0.00088 [V] as shown in the simulation result in Figure 25 and in the formula (15). Then, by substituting the corresponding values into the formula (17), ~~0.0005~~ 0.00088 = $\alpha \times 1 \times 0.0032 \times 0.02 \times 0.01$ is obtained, and consequently the parameter depending constant α can be determined to be ~~781.25~~ 1375.

Please replace paragraph 3 at page 54, with the following rewritten paragraph:

The electric field strength E at the position r in the neighborhood of an electric field source (the sending electrode portion 105) in free space at time t can be represented as the following formula, by rearranging the formula (2) under the assumption of "cosωt = 1", at which the electric strength E is the maximum, and under the assumption of $\theta = \pi/2$ for simplification of the discussion:

$$E = E_\theta = \frac{ql}{4\pi\varepsilon r^3} \cdot \left(1 + jkr + (jkr)^2\right) \cdot \exp(-jkr)$$

$$\underline{H = H_\theta = \frac{ql}{4\pi r^3 \eta} \cdot \left(jkr + (jkr)^2\right) \cdot \exp(-jkr)}$$

$$\underline{(\eta = 120\pi)}$$

.....(18)

Please replace paragraph 1 at page 55, with the following rewritten paragraph:

The received power p [W] received by an antenna ~~(the receiving electrode portion 106)~~ with an aperture area K [m^2] is represented by the following formula:

$$p = \frac{SK}{4\pi} \qquad \cdots\cdots \ (19)$$

where the received power density is denoted by S [W/m^2]. The received power density S [W/m^2] in the relation with the received electric strength E is represented by the following formula:

$$\cancel{S = \frac{E^2}{120\pi} \qquad \cdots\cdots \ (20)}$$

$\underline{S = EH}$

Please insert the following new paragraph between paragraphs 1 and 2 at page 55:

Based on the induction filed component of the electric field:

$$E_2 = \frac{ql}{4\pi\varepsilon r^3} \cdot jkr \cdot \exp(-jkr)$$

.....(20)

$$H_2 = \frac{ql}{4\pi\varepsilon r^3 \eta} \cdot jkr \cdot \exp(-jkr)$$

.....(21)

$$(\eta = 120\pi)$$

, the component S_2 for the induction field of the power density is represented by the following formula:

$$S_2 = E_2 H_2$$

.....(22)

Please replace paragraphs 2 and 3 at page 55 continuing onto page 56, with the following rewritten paragraphs:

[~~Accordingly, the received power p [mW] is represented by the following formula obtained by substituting the formula (20) into the formula (19):~~

$$\cancel{p = \frac{SK}{4\pi} = \frac{E^2 K}{480\pi^2} = 1000 \cdot \frac{E^2 K}{480\pi^2} [mW] \quad .....(21)}]$$

<u>Accordingly, the induction field component p of the received power is as follows:</u>

$$\underline{p = \frac{S_2 K}{4\pi} = \frac{E_2 H_2 K}{4\pi}[W] = 1000 \cdot \frac{E_2 H_2 K}{4\pi}[mW]}$$

.....(23)

~~By substituting the formula (18) for the "E" in the formula (21) to determine the product ql of the charge q and the distance l from the charge of a microdipole such that the product ql is below the noise floor nf [dBm] by 10 [dB] at the position r in the neighborhood of the electric field source (the sending electrode portion 105), the following formula is obtained:~~

$$\cancel{p = \frac{SK}{4\pi} = \frac{E^2 K}{480\pi^2} = 1000 \cdot \frac{E^2 K}{480\pi^2} [mW]}$$

~~.....(21)~~

Accordingly, the induction field component p of the received power is as follows:

$$\underline{p = \frac{S_2 K}{4\pi} = \frac{E_2 H_2 K}{4\pi}[W] = 1000 \cdot \frac{E_2 H_2 K}{4\pi}[mW]}$$

~~By substituting the formula (18) for the "E" in the formula (21) to determine the product ql of the charge q and the distance l from the charge of a microdipole such that the product ql is below the noise floor nf [dBm] by 10 [dB] at the position r in the neighborhood of the electric field source (the sending electrode portion 105), the following formula is obtained:~~

$$\cancel{1000 \cdot \frac{E^2 K}{480\pi^2} = 1000 \cdot \frac{\left(\frac{ql}{4\pi\varepsilon r^3} \cdot \left|jkr \cdot \exp(-jkr)\right|\right)^2 \cdot K}{480\pi^2} < 10^{\frac{nf-10}{10}}}$$

~~(22)~~

The formulas (20) and (21) are substituted for the E_2 and H_2 in the formula (23), respectively, and the product ql of the charge q of a microdipole and the distance l between two charges of the microdipole is obtained so that the induction field component p becomes smaller

than the noise floor nf [dBm] by 10 [dB] at a distance of r from the electric field source (microdipole). Since

$$P = 1000 \cdot \frac{E_2 H_2 K}{4\pi} = 1000 \cdot \frac{\left(\frac{ql}{4\pi\varepsilon r^3} \cdot \mathrm{Re}(jkr \cdot \exp(-jkr))\right)^2 K}{4\pi\eta}$$

$$= 1000 \cdot \frac{\left(\frac{ql}{4\pi\varepsilon r^3} \cdot \mathrm{Re}(jkr \cdot \exp(-jkr))\right)^2 K}{480\pi} < 10^{\frac{nf-10}{10}}$$

, by rearranging the following equation:

~~The maximum value of the product ql (hereinafter referred to as the maximum product) ql_{max} is shown in the following formula:~~

$$\cancel{1000 \cdot \frac{\left(\frac{ql_{max}}{4\pi\varepsilon r^3} \cdot \left|jkr \cdot \exp(-jkr)\right|\right)^2 \cdot K}{480\pi^2} = 10^{\frac{nf-10}{10}}} \quad \cdots\cdots (23)$$

$$1000 \cdot \frac{\left(\frac{ql_{max}}{4\pi\varepsilon r^3} \cdot \mathrm{Re}(jkr \cdot \exp(-jkr))\right)^2 K}{480\pi} = 10^{\frac{nf-10}{10}} \qquad (23)$$

, the maximum value of the product ql (hereinafter referred to as the maximum product) ql_{max} is obtained.

[~~And, the maximum product ql_{max} can be obtained from the following formula obtained by rearranging the above formula.~~]

$$\cancel{ql_{\max} = \sqrt{10^{\frac{nf-10}{10}} \frac{480\pi^2}{1000 \cdot K} \frac{4\pi\varepsilon r^3}{|jkr \cdot \exp(-jkr)|}} \quad \cdots\cdots (24)}$$

$$\underline{ql_{\max} = \sqrt{10^{\frac{nf-10}{10}} \cdot \frac{4\pi\eta}{1000 \cdot K} \cdot \frac{4\pi\varepsilon r^3}{\mathrm{Re}(jkr \cdot \exp(-jkr))}}}$$

.....(24)

In this formula (24), a function Re is used to represent the real part of the complex number.

Please replace paragraphs 1 and 2 at page 56 continuing onto page 57, with the following rewritten paragraphs:

The noise floor nf is defined by the following formula:

$$nf = -174[dBm/Hz] + NF + 10\log B[dBm] \quad \cdots\cdots (25)$$

where NF is a noise index and B [Hz] is a communication band.

Practically, for example, in the case where the frequency f is 4 [MHz], the noise index NF is 10 [dB], the communication band B is 100 [kHz], the aperture area K of the receiving electrode portion 106 is 0.03 [m^2], and $\theta = \pi/2$, it is apparent from the formula (24) that the output of an induction field at a distance of 0.05 [m] from the sending electrode portion 105 can be below the noise floor nf (= -174+10+10 log (1000000) = 114 [dBm]) if the maximum product ql_{max} is $\cancel{1.5\times10^{-16}}$ $\underline{ql_{max} = 6.28 \times 10^{-15}}$. However, actually, if the product ql satisfies "$ql<ql_{max}$", then the induction field component at a neighbor position r at a distance of 0.05 [m] from the sending electrode portion 105 can be below the noise floor nf.

Please replace paragraph 2 at page 57, with the following rewritten paragraph:

That is, by substituting θ = π/2 and ql_{max} = [~~1.5×10^{-16}~~] $\underline{6.28 \times 10^{-15}}$ into the formula (18), the electric field strength E (E_θ) of the composite electric field is represented by the following formula:

$$\text{E} =$$

$$\cancel{E_\theta = \frac{ql_{max}}{4\pi\varepsilon r^3}\left(1 + jkr + (jkr)^2\right)\cdot\exp(-jkr)}$$

$$= \frac{1.5\times10^{-16}}{4\pi\varepsilon r^3}\left(1 + j\frac{2\pi f}{c}r + \left(j\frac{2\pi f}{c}r\right)^2\right)\cdot\exp(-jkr) \quad \cdots\cdots (26)$$

$$\underline{E =}$$

$$\underline{E_\theta = \frac{ql_{max}}{4\pi\varepsilon r^3}\cdot\left(1 + jkr + (jkr)^2\right)\cdot\exp(-jkr)}$$

$$\underline{= \frac{6.28\times10^{-15}}{4\pi\varepsilon r^3}\cdot\left(1 + j\frac{2\pi f}{c}r + \left(j\frac{2\pi f}{c}r\right)^2\right)\cdot\exp(-jkr)}$$

$\underline{.....(26)}$

By substituting to the formula (26) the permittivity of vacuum electric constant ε = 8.85e-12, the frequency ~~f=4~~ f=4e6, and the wavelength k = 2πf/c (c: light velocity), the electric field strength E of the composite electric field and the neighbor distance r from the electric field source can be plotted in the relation shown in Figure 28.

Please replace paragraph 2 at page 58, with the following rewritten paragraph:

~~In this way, if the frequency f, the noise index NF, the communication band B, the aperture area K of the receiving electrode portion 106 and the neighbor position r from the~~

~~sending electrode portion 105 are specifically determined~~ If the frequency f, the noise index NF, the communication band B, a distance r between the sending electrode portion 105 and the neighbor position, and the aperture area K of the virtual antenna for evaluating power at the neighbor position are specifically determined, the maximum product ql_{max} of the charge q and the distance l from the charge of the microdipole and can be determined from the formula (24).

Please replace paragraphs 1, 2 and 3 at page 59 continuing onto page 60, with the following rewritten paragraphs:

For example, when a sending electrode portion 105 with an electrode area A_S of 4×4 [cm^2] and a distance between electrodes d_S of 4 [cm] was arranged in free space, and a potential of 1 [V] was applied to the sending electrode portion 105 with a single frequency f_0, the electric field generated from the sending electrode portion 105 multiplied by ~~0.002~~ 0.084 almost corresponded to the curve of figure 28.

This means that, if a potential V_S of ~~0.002~~ 0.084 [V] (0.04×0.04, 0.04, f_0) is applied to the sending electrode portion 105, the strength of the induction field at a limit position $r_{neighbor}$ in the communication range with the sending electrode portion 105 as the center thereof is below the noise floor nf.

From this, the maximum potential (hereinafter referred to as maximum applicable potential) AV_{Smax} (A_S, d_S, f) which can be applied to the sending electrode portion 105 and which corresponds to the maximum ql_{max} (f) depending on the frequency f is represented by the following formula:

~~$$A\,V_{S\max}(A_S, d_S, f) = \sqrt{10^{\frac{-174+10+10\log(B)-10}{10}} \cdot \frac{480\pi^2}{1000 \cdot K}} \cdot \frac{4\pi\varepsilon \cdot r_{neighbour}^{3}}{\left| j\frac{2\pi f}{c} r_{neighbour} \cdot \exp\left(-j\frac{2\pi f}{c} r_{neighbour}\right)\right|} \times \frac{V_S(A_S, d_S, f_0)}{ql_{\max}(f_0)}$$~~

...... (28)

$\underline{AVs\max(A_S, d_S, f)}$

$$\underline{= \sqrt{10^{\frac{-174+10\log(100000)}{10}} \cdot \frac{480\pi^2}{1000 \cdot K}} \cdot \frac{4\pi\varepsilon \cdot r_{neighbour}^{3}}{\mathrm{Re}\left(j\frac{2\pi f}{c} r_{neighbour} \cdot \exp\left(-j\frac{2\pi f}{c} r_{neighbour}\right)\right)} \times \frac{V_S(A_S, d_S, f_0)}{ql_{\max}(f_0)}}$$

<u>.....(28)</u>

where the single frequency used in the simulation by the electric field simulator is denoted by f_0 and the potential to be obtained which has been obtained by the simulation is denoted by V_S (A_S, d_S, f_0).

Please replace paragraph 1 at page 60, with the following rewritten paragraph:

As an example, when the conditions of the simulation results (the potential V_S (0.04×0.04, 0.04, 4) applied to the sending electrode portion 105 with an electrode area A_S of 4×4 [cm^2] and a distance between electrodes d_S of 4 [cm] was ~~0.002~~ <u>0.084</u> [V]) are added to the conditions in the case where the maximum product ql_{max} is assumed to be ~~1.5×10^{-16}~~ <u>6.28×10^{-15}</u> from the formula (24) (the single frequency F_0 is 4 [MHz], the noise index NF is 10 [dB], the communication band B is 100 [kHz], the aperture area K of ~~the receiving electrode portion 106~~ <u>the antenna used for evaluating power at a distance of 0.05 [m]</u> is 0.03 [m^2] and θ = π/2), by substituting the values into the corresponding terms, in the formula (28), the maximum applicable potential is represented by the following formula:

$\cancel{AVs\max = (0.004 \times 0.004, 0.004, f)}$

$$\cancel{= \sqrt{10^{\frac{-174+10\log(100000)}{10}} \cdot \frac{480\pi^2}{1000 \cdot 0.03^2}} \cdot \frac{4\pi\varepsilon \cdot 0.05^3}{\left| j\frac{2\pi f}{c}0.05 \cdot \exp\left(-j\frac{2\pi f}{c}0.05\right) \right|} \times \frac{0.002}{ql\left(4 \times 10^6\right)}}$$

$\underline{AVs\max(0.04 \times 0.04, 0.04, f)}$

$$\underline{= \sqrt{10^{\frac{-174+10\log(100000)}{10}} \cdot \frac{480\pi^2}{1000 \cdot 0.03}} \cdot \frac{4\pi\varepsilon \cdot 0.05^2}{\mathrm{Re}\left(j\frac{2\pi f}{c}0.05 \cdot \exp\left(-j\frac{2\pi f}{c}0.05\right) \right)} \times \frac{0.084}{ql\left(4 \times 10^6\right)}}$$

.....(29)

Figure 30 shows the relation between the frequency f and the maximum applicable potential AV_{Smax} (0.04×0.04, 0.04, f) based on the above formula (29). As apparent from Figure 30, the electric field strength of the induction field at a distance of 5 [cm] from the electric field source (the sending electrode portion 105) can be below the noise floor at any frequency f.